GO-GRASS

Grass-based circular business models
for rural agri-food value chains

Overview of key grassland management technologies

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Input ATB, RISE, AU, USC, VMT, IFAU, ARAD, OMKI, ...

Review grassland management technologies

GO-GRASS

- Management of the grassland: general and more specific for the demo's
- Technologies for harvesting and collection
- Storage of harvested grass: general and more specific for demo's
- Overview technologies in the different European countries
- Innovation
- Conclusions

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement **N° 862674**

Management grasland

Goal	Positive	Management	Harvesting	Demo
Animal feed	High protein +	Fertilize and mowing	Frequent	Denmark
Nature conservation	Remove grass to decrease nutrients and increase biodiversity	Mowing and removing at time determined by environment	1-2 times a year	Netherlands Germany
Soil cover	Prevent soil erosion	Determined by environment, reseeding/mowing	1-4 times a year	Netherlands
Biomass	High (dry) yield	Grass species selection +	1 time	Sweden

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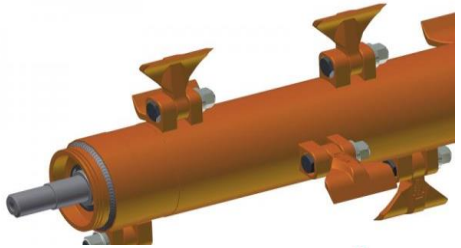
Technologies for harvesting

	Type of mowing	Robustness	Soil collection
Flail mower	Loosely attached flails hit the grass	Very robust	Soil and debris collection inevitable
Rotary mower	Spinning blade cuts the grass	Needs low amounts of obstacles	Possible to avoid soil collection
Sickle mower	Knife-bar blades cut the grass	Needs low amount of obstacles	Possible to avoid soil collection



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Technologies for collecting combined with mowing

Trilo S10 suction wagon with a separate flail mower in front

Combined mowing and harvesting equipment used in the Danish DEMO (grasstech gt-140)

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Technologies for collecting seperate from mowing

Rotary rake

High pressure bailing

Collecting reed canary grass in the Swedish demo

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Storage of grass - bulk

Tower silos

Open-pit plate silo with a plastic cover and car tyres

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Storage of grass - batch

Square bale maker and different bale storages : silage or dry

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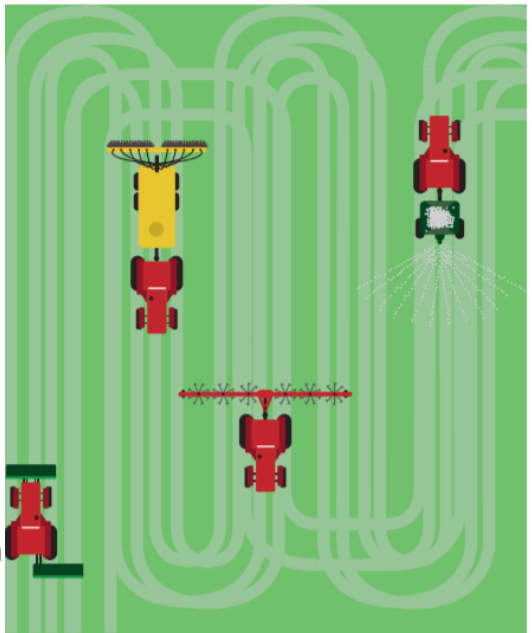
Overview key technologies Europe

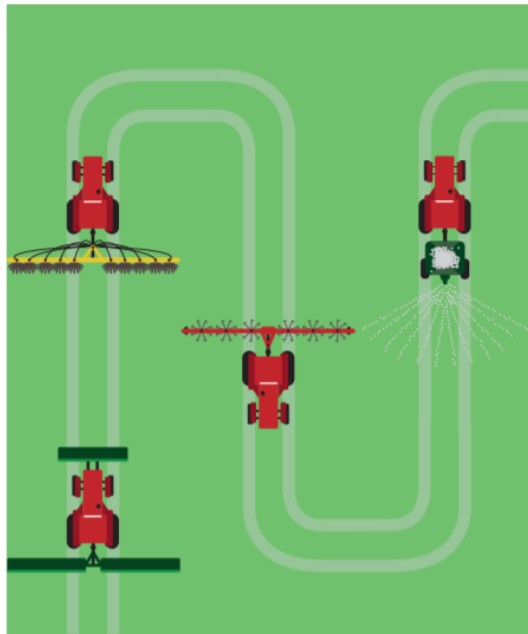
		NL	DE	SW	DK	HU	E	RO
Mowing	Flail mowing	X				X	X	X
	Rotary mowing	X	X	X	X	X	X	X
	Sickle/bar mowing	X				X	X	X
	Immediate collection	X	X	X	X	X	X	X
Collection	Tedding	X	X	X	X	X	X	X
	Rotary raking	X	X	X	X	X	X	X
	Collecting loose grass	X						X
	Collecting in bales (using machines)	X	X	X	X	X	X	X
	Collecting in bales (manual labour)							X
Bulk storage	Pit plate	X				X	X	X
	Tower silo					X		X
	Hay stack						X	X
	Trench box (bunker silo)	X				X	X	X
Batch storage	Unwrapped bales		X	X	X	X	X	X
	Wrapped bales	X				X	X	X
	Wrapped tunnel storage							X
	Outdoor storage (unwrapped bales)		X	X	X	X	X	X
	"Roofed" storage (hangar/hay barn)	X	X	X	X	X	X	X
	Additives with silage	X				X	X	X

Grass most robust technologies , innovation in

- Precision technologies (sensing/yield..)
- Increasing biodiversity (herbs) in production grassland
- Fixed driving tracks to increase productivity
- Technologies for bioraffinage to increase the value of grass as renewable resource

(as in GO-GRASS pilots)





Picture veeteelt GRAS
MAART 2019

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Conclusions

- There are many types of grassland in Europe and with different goals
- There is also an era of technology for mowing, collecting and storage
- Choices to be made differ between location, goal and socio-economic constraints
- These differ for the different demo locations and purposes

Concept report available at : https://www.go-grass.eu/wp-content/uploads/2020/09/D2.1-Review-paper-on-traditional-and-alternative-grassland-management-technologies.pdf

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